

CLAIMS

What is claimed is:

1. A door control device for a refrigerator having a refrigerator door, comprising:
 - a movable body coupled to the refrigerator door, wherein the movable body is arranged to move in opposite directions in accordance with opening and closing actions of the refrigerator door; and
 - a control unit controlling an opposite directional movement of the movable body in a multi-stage manner.
2. The door control device according to claim 1, further comprising a guide element containing the movable body and guiding the opposite directional movement of the movable body.
3. The door control device according to claim 1, further comprising a link bar hinged at a first end thereof to an end of the movable body, and connected at a second end thereof to the refrigerator door.
4. The door control device according to claim 3, wherein the link bar is hinged to the refrigerator door.
5. The door control device according to claim 4, wherein the link bar is further hinged to the refrigerator door in a position spaced apart from the rotating axis of the refrigerator door by a predetermined distance in a radial direction from the rotating axis.
6. The door control device according to claim 1, wherein the movable body is provided with a plurality of grooves formed along a longitudinal side surface thereof.
7. The door control device according to claim 6, wherein the control unit comprises a locking unit selectively engaging with the plurality of grooves provided to the movable body.
8. The door control device according to claim 7, wherein the control unit further comprises an elastic member elastically supporting the locking unit.

9. The door control device according to claim 8, wherein the locking unit comprises a retractable roller selectively seated in the grooves of the movable body during a movement of the movable body.

10. The door control device according to claim 9, wherein the locking unit further comprises a roller bracket elastically supported at a first end thereof by the elastic member, and rotatably holding the roller at a second end thereof.

11. The door control device according to claim 10, wherein the roller is perpendicularly placed relative to the movable body, and wherein the roller is elastically retractable.

12. The door control device according to claim 6, wherein the grooves of the movable body are smoothly curved to form a waved configuration.

13. The door control device according to claim 6, wherein the grooves are formed on a separate member coupled to a longitudinal side surface of the movable body.

14. The door control device according to claim 1, wherein the device is disposed in a leg casing at a lower portion of the refrigerator.

15. The door control device according to claim 14, wherein the control unit is disposed in a control chamber that is perpendicularly defined at a sidewall of the leg casing.

16. The door control device according to claim 15, wherein the control chamber is integrally formed on a sidewall of the leg casing by outwardly depressing the sidewall.

17. The door control device according to claim 15, wherein the control chamber is defined in a separate member provided at a predetermined position on a sidewall of the leg casing.

18. A door control device for a refrigerator having a refrigerator door, comprising:

a movable body coupled to the refrigerator door, wherein the movable body is arranged to move in opposite directions in accordance with opening and closing actions of the refrigerator door;

a control unit to control an opposite directional movement of the movable body in a multi-stage manner; and

a dampening unit dampening a rearward movement of the movable body during the closing action, thus retarding energy generated from the refrigerator door closing.

19. The door control device according to claim 18, wherein the dampening unit comprises an elastic support unit elastically supporting a rear end of the movable body.

20. The door control device according to claim 19, wherein the elastic support unit comprises a support member supporting the rear end of the movable body, and further comprises an elastic member provided at a rear end of the support member.

21. The door control device according to claim 20, wherein the elastic member is connected to the rear end of the support member.

22. The door control device according to claim 20, wherein the support member is mounted to the rear end of the movable body.

23. The door control device according to claim 20, wherein the elastic member comprises one or more compression springs.

24. The door control device according to claim 20, wherein the elastic member is two or more compression springs arranged in parallel.

25. The door control device according to claim 20, wherein the support unit is disposed in a leg casing at a lower portion of the refrigerator.

26. The door control device according to claim 25, wherein the support unit is disposed on an inner surface of the rear end wall of the leg casing.

27. The door control device according to claim 25, wherein the support unit is disposed between the rear end wall of the leg casing and the rear end of the movable body.

28. A refrigerator, comprising:

a cabinet with a storage compartment;

a door hinged to the cabinet to close the storage compartment;

a leg casing installed in a lower portion of the cabinet;

a movable body coupled to door, wherein the movable body is arranged in the leg casing so as to move in opposite directions in the leg casing; and

a control unit to control an opposite directional movement of the movable body in a multi-stage manner.

29. The refrigerator according to claim 28, further comprising a guide element installed in the leg casing to contain the movable body and to guide the opposite directional movement of the movable body.

30. The refrigerator according to claim 28, further comprising a link bar hinged at a first end thereof to an end of the movable body, and connected at a second end thereof to the door.

31. The refrigerator according to claim 30, wherein the link bar is hinged to the door.

32. The refrigerator according to claim 31, further comprising a hinge bracket mounted to the door, wherein the link bar is connected to the hinge bracket.

33. The refrigerator according to claim 31, wherein the link bar is hinged to the door in a position spaced apart from the rotating axis of the door by a predetermined distance in a radial direction from the rotating axis.

34. The refrigerator according to claim 28, wherein the movable body is provided with a plurality of grooves formed along a longitudinal side surface thereof.

35. The refrigerator according to claim 34, wherein the control unit comprises a locking unit selectively engaging with the plurality of grooves provided to the movable body.

36. The refrigerator according to claim 35, wherein the control unit further comprises an elastic member elastically supporting the locking unit.

37. The refrigerator according to claim 36, wherein the locking unit comprises a retractable roller selectively seated into the grooves of the movable body during a movement of the movable body.

38. The refrigerator according to claim 37, wherein the locking unit further comprises a roller bracket elastically supported at a first end thereof by the elastic member, and rotatably holding the roller at a second end thereof.

39. The refrigerator according to claim 38, wherein the roller is perpendicularly placed relative to the movable body, and the roller is elastically retractable.

40. The refrigerator according to claim 34, wherein the grooves of the movable body are curved to form a waved configuration.

41. The refrigerator according to claim 34, wherein the grooves are formed on a separate member coupled to a longitudinal side surface of the movable body.

42. The refrigerator according to claim 28, further comprising a control chamber perpendicularly defined at a sidewall of the leg casing, wherein the control unit is disposed in the control chamber.

43. The refrigerator according to claim 42, wherein the control chamber is integrally formed on a sidewall of the leg casing by outwardly depressing the sidewall.

44. The refrigerator according to claim 42, wherein the control chamber is defined in a separate member provided at a predetermined position on a sidewall of the leg casing.

45. A refrigerator, comprising:
a cabinet with a storage compartment;

a door hinged to the cabinet to close the storage compartment;
a leg casing installed in a lower portion of the cabinet;
a movable body coupled to the door, wherein the movable body is arranged in the leg casing so as to move in opposite directions in the leg casing in accordance with door opening and door closing actions;
a control unit to control an opposite directional movement of the movable body in a multi-stage manner; and
a dampening unit provided in said leg casing to dampen a rearward movement of the movable body during a door closing action, thus retarding energy generated from the door closure.

46. The refrigerator according to claim 45, wherein the dampening unit comprises an elastic support unit to elastically support a rear end of the movable body.

47. The refrigerator according to claim 46, wherein the elastic support unit comprises a support member supporting the rear end of the movable body, and further comprises an elastic member provided at a rear end of the support member.

48. The refrigerator according to claim 47, wherein the support member is mounted to the rear end of the movable body.

49. The refrigerator according to claim 47, wherein the elastic member is connected to the rear end of the support member.

50. The refrigerator according to claim 47, wherein the elastic member comprises one or more compression springs.

51. The refrigerator according to claim 47, wherein the elastic member is two or more compression springs arranged in parallel.

52. The refrigerator according to claim 47, wherein the support unit is disposed on an inner surface of the rear end wall of the leg casing.

53. The refrigerator according to claim 47, wherein the support unit is disposed between the rear end wall of the leg casing and the rear end of the movable body.